APPENDIX A

Pending Claims

1. A system for detecting the level of liquid in a vessel, comprising:

a detector assembly including

a thermally conductive substrate,

a heater mounted on said substrate such that said heater is thermally coupled to the interior of the vessel, said heater being able to be actuated to add heat to the surface of the substrate thermally coupled to the interior of the vessel, and

a sensor mounted on said substrate in proximity to said heater such that discrete elevations of the interior of the vessel are thermally coupled to corresponding longitudinal portions of said sensor to generate an electrical signal defining a temperature signal, said correspondence being incrementally continuous such that the elevations corresponding to said portions of said sensor increase from one to the other of the ends of said sensor, said sensor being able to be actuated to detect the temperature in the vessel in proximity to the sensor indicative of the temperature detected by said sensor, said sensor having a vertical dimension sufficiently large such that said temperature signal will vary in proportion to said longitudinal portion of said sensor thermally coupled to the liquid;

a processor electrically connected to said sensor for receiving said temperature signal after actuation of said heater, said processor being programmed to use said temperature signal to calculate the elevation of

the upper surface of the liquid in the vessel thereby to generate an electrical signal defining an elevation signal indicative of the elevation of the liquid upper surface relative to the lower end of said sensor;

an interface electrically connected to said processor for receiving said elevation signal for use as the basis for communicating to the user the elevation of the liquid upper surface; and

a power supply electrically connected to said heater, sensor, processor, and interface, and wherein said sensor comprises a variable resistance means wherein the resistance to electrical conductivity of said sensor varies in proportion to the temperature detected by it, said temperature signal being of a magnitude proportional to the magnitude of the resistance, said programming of said processor comprising using said temperature signal to measure said resistance of said sensor, said programming further comprising using said resistance to calculate the elevation of the upper surface of the liquid.

2. A system as set forth in claim 1, wherein said longitudinal portions of said sensor define a longitudinal axis of said sensor having a vertical orientation.

3. A system as set forth in claim 1, wherein said lower end of said sensor is positioned above the lower inner surface of the vessel by a vertical clearance, said processor being programmed further to interpret the elevation signal to be indicative of the elevation of the liquid upper surface relative to the lower end of said sensor and of said vertical clearance such that said

interface communicates to the user the elevation of the liquid upper surface relative to the lower inner surface of the vessel.

9. A system as set forth in claim 1, wherein said heater is constituted by said sensor.

10. A system as set forth in claim 1, wherein said sensor is disposed in the interior of the vessel.

11. A system for detecting the level of liquid in a vessel, comprising:

a detector assembly including a thermally conductive substrate,

a heater mounted on said substrate such that said heater is thermally coupled to the interior of the vessel, said heater being able to be actuated to add heat to the surface of the substrate thermally coupled to the interior of the vessel, and

upper, intermediate and lower sensors mounted on said substrate in proximity to said heater, said upper sensor being at a higher elevation relative to said lower sensor, said intermediate sensor being at an elevation between said upper and lower sensors, said upper and lower sensors being thermally coupled to the interior of the vessel to detect the temperature therein in proximity to said upper and lower sensors, said upper and lower sensors being able to be actuated to generate respective electrical signals each defining a temperature signal indicative of said temperatures detected by said upper and lower sensors, said intermediate sensor being mounted on said

substrate such that discrete elevations of the interior of the vessel are thermally coupled to corresponding longitudinal portions of said intermediate sensor to detect the temperature in the vessel in proximity to the sensor, said correspondence being incrementally continuous such that the elevations corresponding to said portions of said intermediate sensor increase from one to the other of the ends of said intermediate sensor, said intermediate sensor being able to be actuated to generate an electrical signal defining a temperature signal indicative of the temperature detected by said intermediate sensor, said intermediate sensor having a vertical dimension sufficiently large such that said temperature signal will vary in proportion to said longitudinal portion of said intermediate sensor thermally coupled to the liquid;

a processor electrically connected to each of said sensors for receiving said temperature signals after actuation of said heater, said processor being programmed to use said temperature signals to calculate the elevation of the upper surface of the liquid in the vessel thereby to generate an electrical signal defining an elevation signal indicative of the elevation of the liquid upper surface;

an interface electrically connected to said processor for receiving said elevation signal for use as the basis for communicating to the user the elevation of the liquid upper surface; and

a power supply electrically connected to said heater, intermediate sensor, lower sensor, upper sensor, processor, and interface, and

wherein said sensor comprises a potentiometer wherein the resistance to electrical conductivity of said sensor varies in proportion to the temperature detected by it, said temperature signal being equal to said resistance, said programming of said processor comprising using said temperature signal to measure said resistance of said sensor, said programming further comprising using said resistance to calculate the elevation of the liquid upper surface.

12. A system as set forth in claim 11, wherein said processor comprises an electronic microprocessor.

13. A system for detecting the level of liquid in a vessel, comprising:

a detector assembly including a thermally conductive substrate;

a heater mounted on said substrate such that the heater is thermally coupled to the interior of the vessel, the heater being able to be actuated to add heat to the surface of the substrate thermally coupled to the interior of the vessel;

an elongated electrical resistance-type sensor mounted on the substrate in proximity to said heater such that discrete elevations of the interior of the vessel are thermally coupled to corresponding longitudinal portions of the sensor to generate electrical signal defining a temperature signal at various elevations in the vessel, the longitudinal portions being incrementally continuous such that the elevations corresponding to the longitudinal portions increase along a length of the sensor, the sensor being able to

be actuated to detect the temperature in the vessel at discrete elevations of the interior of the vessel at elevations where liquids in the vessel are thermally coupled to the liquid;

a processor electrically connected to the sensor for receiving the temperature signal after actuation of said heater, the processor being programmed to use the temperature signal to calculate the elevation of the upper surface of the liquid in the vessel to generate a further electrical signal defining an elevation signal indicative of the elevation of the upper surface of the liquid; and

an interface electrically connected to said processor for receiving said elevation signal to communicate to the user the elevation of the upper surface of the liquid.

14. The system of claim 13 wherein a power supply is electrically connected to the heater, sensor, processor, and interface, and wherein said sensor comprises a variable resistance means wherein the resistance to electrical conductivity of the sensor varies in proportion to the temperature detected by it, the temperature signal being of a magnitude proportional to the magnitude of the resistance, the programming of said processor comprising using the temperature signal to measure said resistance of the sensor, the programming further comprising using the resistance to calculate to calculate the elevation of the liquid upper surface of the liquid.

15. The system of claim 1 wherein the variable resistance means is a potentiometer.

16. A method of detecting the level of liquid in a vessel, comprising:

providing a thermally conductive substrate to the interior of a vessel to contain a liquid,

mounting a heater to the substrate such that the heater is thermally coupled to the interior of the vessel, the heater being able to be actuated to add heat to the surface of the substrate thermally coupled to the interior of the vessel;

mounting an elongated electrical resistance-type sensor the substrate in proximity to the a heater mounted on said substrate such that the heater is thermally coupled to the interior of the vessel, the heater being able to be actuated to add heat to the surface of the substrate thermally coupled to the interior of the vessel;

electrically connecting a processor to the sensor for receiving the temperature signal after actuation of said heater, the processor being programmed to use the temperature signal to calculate the elevation of the upper surface of the liquid in the vessel to generate a further electrical signal defining an elevation signal indicative of the elevation of the upper surface of the liquid; and

electrically connecting and interface to the processor for to communicate to the user the elevation of the upper surface of the liquid.

17. The method of claim 16 wherein a power supply is electrically connected to the heater, sensor, processor, and interface, and wherein said sensor comprises a variable resistance means wherein the resistance to electrical

conductivity of the sensor varies in proportion to the temperature detected by it, the temperature signal being of a magnitude proportional to the magnitude of the resistance, the programming of said processor comprising using the temperature signal to measure said resistance of the sensor, the programming further comprising using the resistance to calculate to calculate the elevation of the liquid upper surface of the liquid.